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ABSTRACT

A study to investigate the development of children's ability to relate concepts and thus understand metaphors by examining their performance on three concept-relating tasks is reported. Abstract-metaphoric, concrete-metaphoric, and literal taxonomic relationships were embedded in an analogy-like binary choice task. In this type of task, the children were presented all four terms of a proportion but only partial information about where each term fit into the proportion. As anticipated, the children's performance reflected a general developmental trend, improving with age. Performance was significantly above chance for all tasks at all grade levels, with the exception of the literal taxonomic task for preschoolers. Performance on the literal task was significantly poorer than on either of the metaphoric tasks, while performance on the abstract and concrete metaphoric tasks was quite comparable. The data do not support the hypothesis that children's literal language should surpass their metaphoric language or that their ability to relate concepts begins at a primitive, concrete level and gradually develops to comprehension of abstract metaphors. The ability to relate disparate concepts does not appear to be a metaphor-specific ability that could account for children's development of metaphor comprehension. (MSE)

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The Development of Metaphor Comprehension

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There are several questions that might be posed regarding metaphor comprehension and psycholinguistic development. The most general question is, does the ability to comprehend metaphor develop? The answer is an unequivocal yes. Adults can comprehend a vast array of subtle, intricate and sophisticated figurative uses of language. Similar facility with figurative language is clearly absent in young children, and it goes without saying that infants cannot comprehend figurative language at all.

The answer to whether metaphor comprehension develops is banal, but the answer to how metaphor comprehension develops is another matter altogether. The very nature of the question prevents a simple answer. Moreover, even the most cursory of theoretical forays into explanatory accounts of metaphor comprehension reveal the process to be vastly complex. Metaphoric ability is not a simple, unitary ability, but a composite ability, no doubt an orchestration of many tightly interwoven capacities and processes which differs from performance to performance. Some of the many abilities contributing to metaphor comprehension include the ability to sit still and pay attention; vocabulary acquisition; knowledge of the world. Yet these abilities come to play in virtually any cognitive performance, especially psycholinguistic types of performances. The study of such general abilities is obviously important, and

their incorporation into metaphor comprehension should not be ignored. In fact, I shall argue that it is exactly such factors that researchers should focus on. Still, attributing metaphor development to general cognitive development seems unsatisfactory as a theoretical explanation: "He learned to sit still and pay attention" hardly seems to help explain how a child acquires metaphoric comprehension. Presumably we are interested in explaining how metaphor comprehension itself develops, apart from the development of extraneous, general abilities. That is, we are concerned with the development of metaphor per se.

A new question arises now. Does the ability to comprehend metaphor per se develop? At first this third question might not appear to be much different from the first question. but in order to answer the per se', one must identify some ability or set of abilities that are not general, but metaphor-specific.

One metaphor-specific ability implicated in the literature is the ability to relate figurative concepts. When producing a metaphor such as "My son is pure gold," the speaker presents two conventionally unrelated or dissimilar concepts, my son, which is a personal entity, and pure gold, which is an inanimate material. Yet the speaker is making the figurative claim that there is a basis for

relating these two objects sufficient to justify their equation. The ability to establish the basis of the relationship between two objects is fundamental in comprehending a metaphor and is a plausible candidate for the metaphor-specific ability underlying the development of metaphor comprehension.

Although concept relating can justifiably be regarded as a metaphor-specific ability, it too is a composite skill. Facility at relating concepts is a function of many general abilities: Elaborateness of knowledge about the concepts; the ability to attend to several aspects of the related concepts simultaneously (often referred to as short term memory); etc.. Performance on concept relating tasks also is affected by whether a subject attempts to use this or that strategy in establishing a relationship. Variables which control such attempts might pull in further extraneous factors such as stylistic preferences and response biases. Certainly the metaphor-specific ability of relating disparate concepts will develop as the relevant general abilities and proclivities develop. Again, one might be loath to consider such general development as a satisfactory theoretical account of metaphor development.

We are thus forced to consider a further question: Does the ability to relate disparate concepts per se develop? If we are not concerned with development that is

an artifact of general development, the banal yes to "does the ability to relate disparate concepts develop?" does not help when that nasty per se' is added.

The earliest thinking on the subject (e.g., Asch & Nerlove, 1960) was that the ability to relate concepts developed from a nonmetaphoric, rigidly literal state, to a flexibly abstract metaphoric state. In essence, the ability to metaphorically relate disparate concepts (per se) was seen as initially absent and gradually emerging. The assumption implied that the development of metaphoric language was independent of the development of literal language, or at least that literal abilities kept far enough apace of the metaphoric abilities as to render the course of literal development irrelevant to the course of metaphoric development.

However, evidence accumulated against these assumptions. Children were observed to comprehend and produce metaphoric language from the beginning of their language development (e.g., Billow, 1981; Carlson & Anisfeld, 1969; Winner, 1979; Winner, McCarthy & Gardner, 1979). Of course, there remained a qualitative difference between the types of metaphors children could cope with and the types adults could manage. In particular, children first mastered physically grounded metaphors and later broadened their abilities to include more abstract relationships.

The earliest concrete relationships are based on physical similarity or functional role: e.g.; pretending a banana is an airplane zooming through the air. Such concrete metaphors are the common fare of symbolic play (cf. Billow, 1981). In the case of more abstract metaphors, a physical property must somehow be related to a psychological or social phenomenon. Thus, the development of the ability to relate disparate concepts (per se) was seen as taking the child from a rudimentary metaphoric ability to a subtle refinement in abstract metaphors. Again, this perspective presupposed that general cognitive and linguistic abilities imposed no consequential constraints on performance on figurative language tasks, but that all advances in figurative language reflected an advance in some underlying metaphoric ability.

Some evidence has accumulated against this second perspective as well. General (nonmetaphoric) cognitive/linguistic development has been indicated as a major factor in performance of tasks intended to tap purely metaphorical competence. Studies have uncovered a host of nonmetaphoric variables that interfere with young children's performance in experimental metaphor tasks, including response demands (Verbrugge, 1981), semantic complexity, syntactic cues, overtness (Reynolds & Ortony, 1980), and contextual depth (Ortony, Schallert, Reynolds & Antos, 1978). Moreover, when tasks are made age appropriate by ruling out such

extraneous variables, young children demonstrate ability to relate abstract concepts metaphorically. Wagner, Winner, Cicchette and Gardner (1981) found infants to have a looking preference for cross-modal (auditory-visual) metaphors. Gardner (1974) found preschoolers successful in a variety of cross-modal metaphoric tasks. Broderick (1983) found preschoolers adept at comprehending color-personality metaphors.

It thus remains a possibility that underlying metaphor-specific abilities develop in only minor ways, and that their apparent development is an artifact of their incorporation into the significantly developing general abilities. The study of metaphor development would thereby shift from mapping out advances in metaphoric ability to mapping out advances in the implementation of existing metaphoric ability.

In order to investigate the development of children's ability to relate concepts we examined children's performance on three concept-relating tasks. Abstract metaphoric, concrete metaphoric, and literal taxonomic relationships were embedded in an anology-like binary choice task. It was assumed that the only way subjects could solve the analogies at a better than chance rate (50%) was if they recognized the underlying relationship grounding the analogy. Unlike standard analogy tasks, in this study

children were presented all four terms of a proportion, but were provided only partial information on where each term belonged in the proportion. This was accomplished by providing the first and second terms of the proportion in a story context, and presenting the remaining two in a correspondence task. The subject's task was to determine which of the last two terms corresponded to a particular one of the first two terms.

In the abstract metaphoric tasks, the proportions were grounded on a personality/color correspondence. The subjects were told a story portraying two opposite personalities and were then shown two metaphorically corresponding colored cards. For example, subjects were told a story about a silly character named Alvin and a serious character named Mr.Winnefred. They were then required to indicate whether a brown card or an orange card with purple polkadots shows that Mr. Winnefred was serious and dignified.' If the subjects were incapable of relating colors to personalities, we would expect only random performance on this task. If the subjects were able to comprehend the abstract relationship between colors and personalities, we would predict better than chance performance.

The concrete metaphor task had a similar design, only the basis of the analogic correspondence was some physical similarity (shape, size, color). Although correspondence

tasks involving physical features are not traditionally considered metaphorical, because the solution to the proportion requires the same physical relationship to be recognized as does concrete metaphor comprehension, this task actually qualifies as metaphoric. In one such task subjects were told a story about a mouse and an elephant, and were then required to indicate whether a watermelon or a grape shows there is a mouse in the story. Subjects unable to appreciate physical correspondences would be expected to perform at a chance level. Subjects capable of recognizing concrete physical relationships would be predicted to perform at a greater than chance level.

The literal task was similarly designed, only the basis of the analogical correspondences involved a higher order taxonomic classification. Objects that belong to the same taxonomic category cannot readily be related metaphorically. For example, Postum and coffee belong to the same taxonomic class; namely <u>hot drinks</u>. Thus, we can say "Postum is like coffee" but not "Postum is coffee." The attempted metaphor reads as a literal falsehood. The same is true of any combination of objects within a taxonomic category: A pen is a pencil; a zebra is a horse; an apple is an orange. These all fail as metaphors and must be interpreted literally. For this reason, the taxonomic classifications were considered literal relationships. The categories of animal, food, and toy were used in the

present study. For one taxonomic task children were told a story about an elephant and a watermelon. They were then asked to indicate whether a mouse or a grape shows there is an elephant in the story. Subjects who could not make the classifiction into animal vs. fruit would not be expected to perform well on this task, although there was some physical basis upon which to make the judgment in lieu of a taxonomic solution (both animals were grey quadrapeds, whereas both fruits were green ovoids). Be that as it may, if subjects were able and willing to relate the stimuli taxonomically, one would predict good performance on this task.

These and some additional metaphoric tasks were incorporated into 20 stories and presented to 100 subjects ranging in age from 3 to 10 (constituting five grade levels, from preschool through the third grade, with 20 subjects at each grade).

As anticipated, children's performance on these tasks reflected a general developmental trend: Performance on all tasks improved with age. This is a standard finding, and requires no special explanation other than children's general improvement in all cognitive and psycholinguistic domains. Although performance improved with age, subjects of all ages performed quite well Performance was significantly above chance (50%) for all tasks at all grade

levels, with the exception of the literal taxonomic task for preschoolers (See Table 1).

Performance on the literal task was significantly poorer than performance on either of the metaphoric tasks, at all grade levels. Performance on the abstract and concrete metaphoric tasks, on the other hand, were not significantly different, and in fact were quite comparable.

These data do not support the hypothesis that children's literal language should surpass their metaphoric language. In fact, performance was poorest for the literal task. Neither do the data support the hypothesis that children's ability to relate concepts begins at a primitive, concrete level, and gradually develops until they can comprehend abstract metaphors. Performance on concrete and abstract metaphor tasks was comparable, and both developed at the same rate. These data are not to be construed as evidence that all literal abilities lag behind all metaphoric abilities, nor that all abstract abilities are on a par with all concrete abilities. Nonetheless, some important literal and concrete relations proved not to have the expected superior status. The ability to relate disparate concepts does not appear to be a metaphor-specific ability that could account for children's development of metaphor comprehension. Either a different metaphor-specific ability must be sought out, or else metaphor development

must be explained as the indirect result of general cognitive and psycholinguistic development. In either case, how cognitive development underlies the differences between adult and child figurative language remains a temptingly open question.

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